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Dry lubricating layers e.g. for moving steel parts - comprising carbon with diamond-like crystal structure

Patent Assignee: PHILIPS PATENTVERWALTUNG GMBH (PHIG)

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Number of Countries: 009 Number of Patents: 006

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
DE 2926080	A	19810108	DE 2926080	A	19790628	198103 B
EP 22285	A	19810114	EP 80200549	A	19800613	198105
JP 56006920	A	19810124			198112	
EP 22285	B	19840215			198408	
DE 3066571	G	19840322			198413	
US 4828728	A	19890509	US 84593783	A	19840327	198922

Priority Applications (No Type Date): DE 2926080 A 19790628

Cited Patents: 4.Jnl.Ref; GB 1311854; GB 907791

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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EP 22285	A	G			
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Designated States (Regional): AT CH DE FR GB LI NL

EP 22285	B	G			
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Abstract (Basic): DE 2926080 A

Dry lubrication is effected by means of thin (10-1000 nm) layer of carbon with a diamond-like crystal structure adhering to the surface of at least one of the moving parts. The carbon layer is pref. produced by plasma-activated chemical vapour deposition on an electrically polarised surface in a gas atmos. contg. an hydrocarbon (esp. acetylene).

The carbon layer has a coefft. of friction comparable to that of graphite and MoS₂ and an abrasion resistance and hardness comparable to borides, silicides, nitrides and carbides.

Abstract (Equivalent): EP 22285 B

Sliding layer contg. C between surfaces (bearing surfaces), which move against or on each other, has sliding friction coeffts. in normal atmos. as well as dry atmos. in the order of magnitude of that of graphite or MoS₂ in dry atmos. Abrasion resistance and hardness is comparable with borides, silicides, nitrides, and carbides. Layer is C with diamond-like structure, 10 nm-10 mmicrons thick, bonded to at least one of the bearing surfaces (substrate).

Pref. it has multi-layer structure, with an intermediate layer of Si or SiO₂ or quasi-amorphous substance, pref. Ti oxycarbide, which improves adhesion of sliding layer. Layer is applied to substrate by plasma-activated deposition from the gaseous phase. (6pp)i

Abstract (Equivalent): US 4828728 A

Dry-lubricated bearing, e.g. for rotary X-ray anodes, has a lubricating layer of C with a diamond-like structure, 10 nm to 10 microns thick, adhesively bonded to a bearing surface by means of an intermediate layer with a lattice structure similar to that of the lubricating layer, selected from Si and Si dioxide. The intermediate

layer can alternatively be a quasi-amorphous layer of Ti oxycarbide.
Lubricating layer is applied to the substrate to be coated in a
plasma-activated deposition process from the gaseous phase.

ADVANTAGE - Layers have exceptionally low coefft. of sliding
friction in the order of 0.01-0.02, with high abrasion resistance and
hardness. (5pp)

Title Terms: DRY; LUBRICATE; LAYER; MOVE; STEEL; PART; COMPRISE; CARBON;
DIAMOND; CRYSTAL; STRUCTURE

Derwent Class: E36; M13; Q62; V05

International Patent Class (Additional): C10M-007/04; C23C-011/00;
F16C-033/10; H01J-035/10

File Segment: CPI; EPI; EngPI

Manual Codes (CPI/A-N): E31-N04; M13-F; M13-K

Manual Codes (EPI/S-X): V05-E01; V05-M03

Chemical Fragment Codes (M3):

01 C810 C106 Q416 Q464 M781 R043 M411 M902

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